SPRING CLASSIFICATION COUNTS

OF THE

BLUENOSE CARIBOU HERD

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SPRING CLASSIFICATION COUNTS OF THE BLUENOSE CARIBOU HERD MARCH 1991

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ABSTRACT

Classification counts of Bluenose caribou were conducted from 11 to 31 March 1991. Caribou were widely distributed on the winter range with concentrations east of Crossley Lakes, near the forks of the Anderson River and east of the Anderson forks. The calf/100 $\geq$ 1 year old females ratio was 38.9 $\pm$ 2.57 (S.E. of the mean) using the Jacknife method to calculate the variance. The calf/cow ratio suggests good calf survival over winter and potential growth of the herd.

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INTRODUCTION

Annual spring composition counts are a component of monitoring the population status of all major barren ground caribou herds in the Northwest Territories. Composition data were collected on the Bluenose herd in 1989 (Fraser and Williams in press), 1988 (McLean and Jackson in prep.), 1986 and 1987 (McLean and Heard 1991), and 1983 (Williams and Elliott 1985). Funding for the 1991 survey was made available to Renewable Resources through the Inuvialuit Final Agreement.

McLean and Heard (1991) suggested that a sample of approximately 30 groups of 100 animals each should give a reasonably precise estimate of the calf/cow ratio for NWT barren-ground herds. Our objective in March 1991 was to locate the major concentration of wintering Bluenose caribou and classify 30 groups.

METHODS

Caribou were located on the winter range just north of Inuvik to south and east of the forks of the Anderson River during a radio-tracking flight flown on 4-7 March 1991 (Figure 1).

On 11, 12, 28, and 31 March 1991 I classified caribou from the ground where feasible or from a helicopter where tree cover, small lakes or small group size made it impractical to land. Groups were selected arbitrarily but different areas were flown daily to spread out the sampling effort. We attempted to sample against the apparent movements of caribou to avoid double counting of animals. The classification methods used were those described by McLean and Heard (1988). We used the Jacknife Method (Sokal and Rohlf 1981) to estimate the calf/cow ratio and the associated variance of calves to 100 $\geq$ 1 year old females.

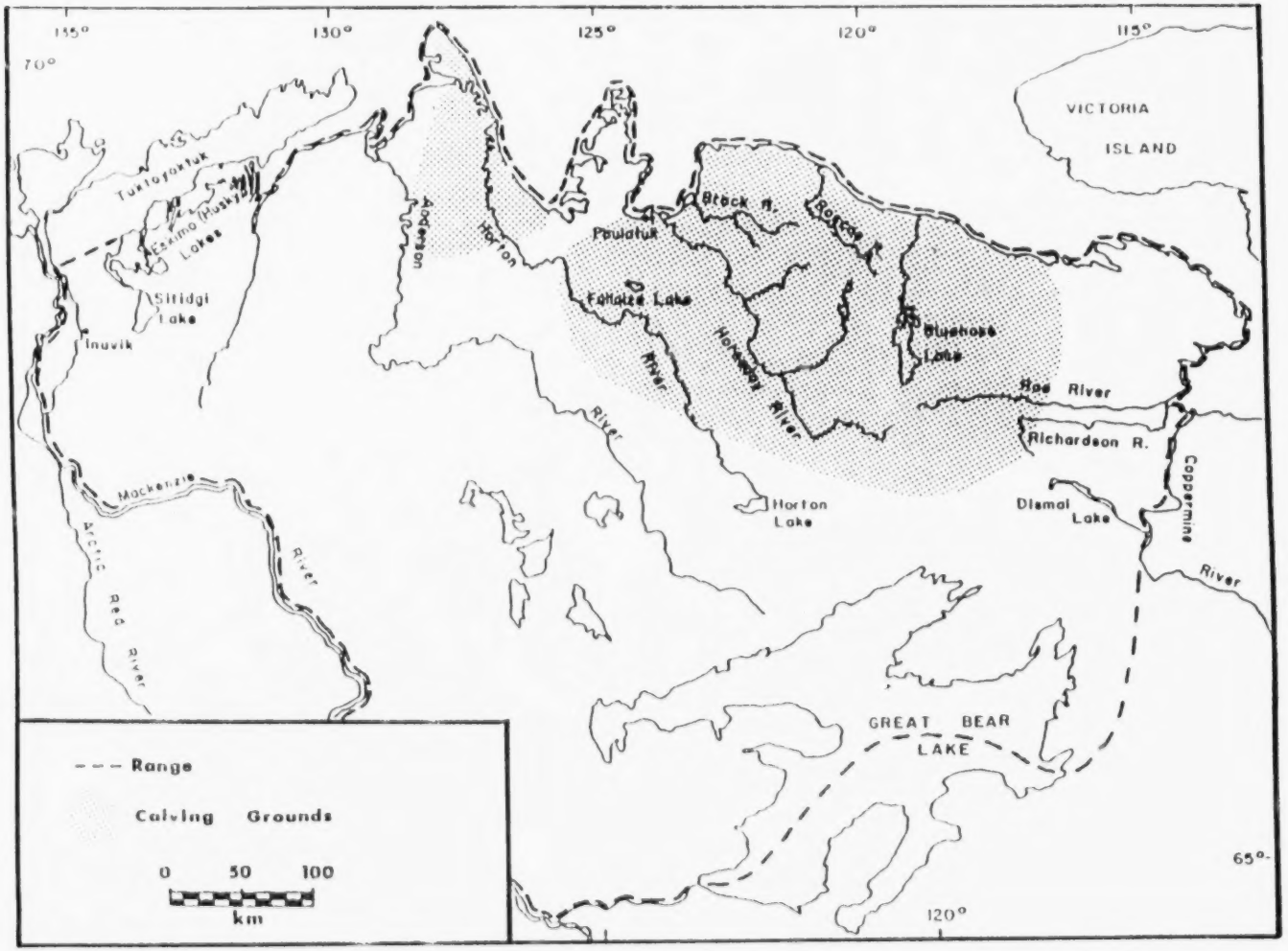

Figure 1. Range of the Bluenose caribou herd, Northwest Territories.

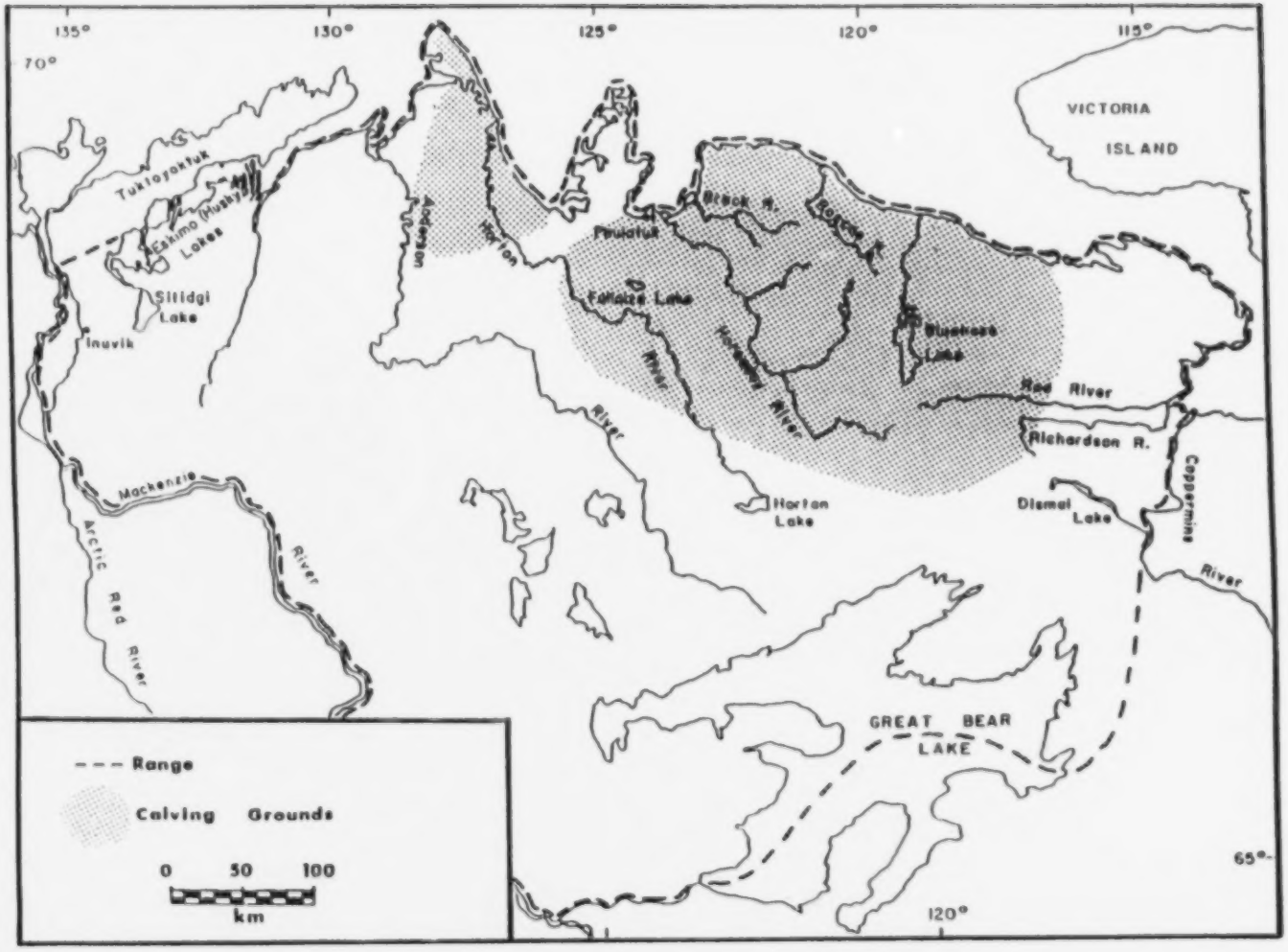

Figure 1. Range of the Bluenose caribou herd, Northwest Territories.

RESULTS

A total of 2774 caribou were classified in 32 groups (Figure 2, Table 1). The calf/cow ratio was 38.9 ± 2.57 (S.E. of the mean). Group size ranged from 26 to 200 with a mean of 85.6 ± 44.1 (S.D.). Calf/cow ratios appeared to be lower in the eastern area sampled (closest to the calving ground). Groups were also observed in the west in which calves were associated with young bulls and not with cows.

A total of 29 wolves were observed during this survey (Table 2). They were all seen in the area with the largest concentrations of caribou, south and east of the forks of the Anderson River.

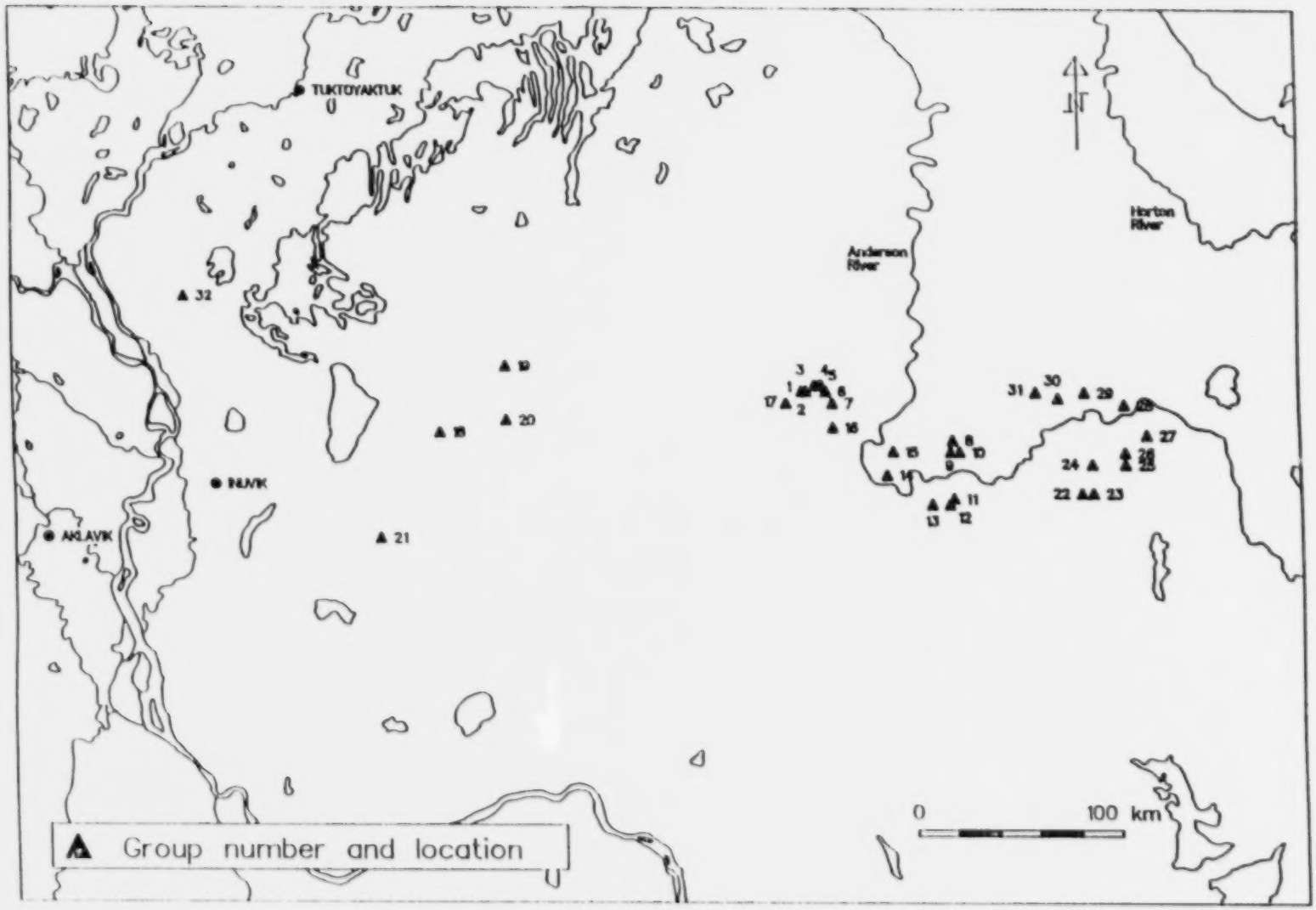

Figure 2. Locations of Bluenose caribou groups classified during the composition survey, March 1991.

Table 1. Age and sex of Bluenose caribou classified in March 1991.

DATE	GROUP#	CALVES			ADULT FEMALE	YRLG FEMALES	YRLG MALES	YOUNG BULLS	MATURE BULLS	TOTAL	CALF/COW RATIO [1]
		MALES	FEMALES	UNKNOWN							
MAR. 11	1	3	4	7	46	3	2	7	0	72	29
MAR. 11	2	10	2	3	29	1	5	6	0	56	30
MAR. 11	3	3	4	7	46	1	7	9	0	77	50
MAR. 11	4	2	0	10	42	0	2	17	1	74	29
MAR. 11	5	9	5	13	52	5	11	11	0	106	47
MAR. 11	6	2	2	3	33	2	1	0	0	43	20
MAR. 11	7	3	5	4	62	4	0	3	0	81	18
MAR. 11	8	2	3	7	56	3	1	11	4	87	20
MAR. 11	9	3	1	5	30	0	0	2	0	41	30
MAR. 11	10	9	7	10	85	6	4	13	3	137	29
MAR. 11	11	3	0	1	28	3	4	17	0	56	45
MAR. 11	12	4	1	4	15	2	3	10	4	43	53
MAR. 11	13	2	2	2	6	0	1	13	6	32	100
MAR. 11	14	4	5	5	32	1	3	30	0	80	42
MAR. 11	15	3	1	3	8	1	1	15	1	33	78
MAR. 11	16	3	3	1	11	2	4	1	1	26	54
MAR. 11	17	3	4	9	30	3	9	20	0	78	48
MAR. 12	18	2	4	6	10	1	6	19	42	90	109
MAR. 12	19	10	6	29	113	9	2	17	0	186	37
MAR. 12	20	7	7	7	27	3	4	11	0	66	70
MAR. 12	21	9	4	14	22	5	4	33	11	102	100
MAR. 28	22	5	4	32	79	8	20	48	4	200	47
MAR. 28	23	3	1	16	54	6	1	8	1	90	33
MAR. 28	24	1	0	15	45	5	4	29	14	113	33
MAR. 28	25	0	5	6	43	7	1	5	0	67	22
MAR. 28	26	4	0	17	48	1	6	34	13	123	43
MAR. 28	27	2	3	6	22	2	2	21	2	60	46
MAR. 28	28	5	4	6	35	2	4	10	1	67	41
MAR. 28	29	4	4	6	32	2	3	1	0	52	41
MAR. 28	30	5	6	15	77	7	3	22	1	136	31
MAR. 28	31	3	0	10	47	4	3	16	0	83	25
MAR. 31	32	3	0	6	10	0	3	63	96	181	90
TOTAL		131	97	285	1275	99	124	522	205	2738	38

[1] Calves per 100 $\geq$ 1 year old females.

Table 2. Wolf observations, Bluenose class counts, March 1991.

Date	Number of wolves	Location (N x W)	Comments
11 March	2 (1 gray, 1 Black)	68°18 X 128°15	Travelling
28 March	10 (grey)	68°30 X 128°20	Fresh kill
"	1 (black)	68°25 X 127°00	Scavenging
"	3 (grey)	68°20 X 126°30	Resting
"	5 (grey)	68°23 X 126°57	Resting
"	8 (4 black, 4 grey)	68°34 X 126°50	Travelling
Total	29		

DISCUSSION

The calf/cow ratio observed in this survey is marginally lower than that reported during previous years (Table 3). The ratio suggests that calf survivorship is still good and that the herd is growing. The actual rate of growth of the herd cannot be determined from these ratios. A post-calving photo census was last done in 1987, and based upon our interpretation of the calf/cow ratios over the intervening years, the herd should have increased substantially. The census is next planned for July 1991.

A review of the NWT caribou program (Heard and Williams 1990) recommends that calf/cow ratios be collected annually for all major caribou herds. This suggestion has been incorporated into the Inuvik region work plans for the Bluenose herd. Parts of the Bluenose herd do winter in the Coppermine area and in some years close to Colville Lake. In years when large numbers of caribou are accessible to Coppermine and Norman Wells those offices should consider determining calf/cow ratios in their area.

Table 3. Composition estimates of the Bluenose Caribou Herd, 1981 to 1991.

Date	Calves: 100 cows (% calves)	Yearlings: 100 adult females	Percent [b] overwinter calf survival	Source
Feb. 1981	(18)[a]	-	-	Carruthers and Jakimchuk 1981
Mar. 1983	44 (22)	18 (9)	59	Williams and Elliott 1985
Mar. 1986	55 (26)	13 (5)	71	McLean & Heard 1991
Mar. 1987	45.8 (23)	14 (6)	75	McLean & Heard 1991
Mar 1988	46 (24)	19 (9)	59	McLean & Jackson In prep.
Mar 1989	44.9 (24)	11 (6)	58	Fraser & Williams In press
Mar 1991	37.3 (18.7)	17.5 (8.1)	47	This study

[a] Aerial classification by fixed-wing.

[b] Assuming 72 calves born per 100 cows in June (Parker 1972, Dauphine 1976) and female survival from June to March of 93% (Heard and Calef 1986)

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LITERATURE CITED

Brackett, D., W. Spencer and E. Hall. 1982. Bluenose caribou surveys 1978-1979. NWT Wild. Serv. File Rep. No. 24. 22pp.

Carruthers, D.R. and R.D. Jakimchuk. 1981. The distribution, numbers and movements of caribou and muskoxen north of Great Bear Lake, Northwest Territories. Rep. prep. for Polar Gas Project by Ren. Res. Consult. Serv. Ltd. 144 pp.

Cochran, W.G. 1977. Sampling Techniques. 3rd. Edition. J. Wiley and Sons Ltd. 423 pp.

Dauphine, T.C., Jr. 1976. Biology of the Kaminuriak population of barren-ground caribou. Part 4: Growth, reproduction and energy reserves. Canadian Wildlife Service Report Series No. 38. 71 p.

Fraser, P. and T.M. Williams. In prep. Spring classification counts of the Bluenose caribou herd, March 1989. NWT Dept. of Ren. Res. Man. Rep. No. 31. 21 pp.

Heard, D.C. and T.M. Williams. 1990. A review of the NWT caribou program. Renewable Resources. unpubl. report.

Heard, D.C. and G. Calef. 1986. Population dynamics of the Kaminuriak caribou herd, 1968 - 1985. Rangifer, Special Issue No. 1, 1986: 159 - 166.

McLean, B.D. and D.C. Heard. 1991. Spring classification counts of the Bluenose caribou herd, March 1986 and 1987. NWT Dept. of Ren. Res. Man. Rep. No. 32. 29 pp.

McLean, B.D. and F. Jackson. In prep. Spring classification counts of the Bluenose caribou herd, March 1989. NWT Dept. of Ren. Res. Man. Rep. No. 30. 19 pp.

Parker, G.R. 1972. Biology of the Kaminuriak population of barren-ground caribou, Part I. Can. Wildl. Serv. Rep. Ser. No. 20. 93 pp.

Sokal,R.R. and F.J. Rohlf. 1981. Biometry. W.H. Freeman and Company. San Francisco. 859 pp.

Williams, T.M. and C. Elliott. 1985. Spring composition counts on the Bluenose herd, March 1983. NWT Dept. of Ren. Res. File Rep. No. 58. 26pp.

Appendix A. Summary of Bluenose caribou composition survey, March 1991.

DATE	GROUP	NO. CALVES	NO. COWS	LOCATION (LONG X LAT)	METHOD
MAR. 11	1	14	49	68 37N X 129 16W	AIR
MAR. 11	2	15	30	68 37N X 129 14W	AIR
MAR. 11	3	14	47	68 38N X 129 10W	AIR
MAR. 11	4	12	42	68 38N X 129 08W	GROUND
MAR. 11	5	27	57	68 38N X 129 07W	AIR
MAR. 11	6	7	35	68 37N X 129 05W	AIR
MAR. 11	7	12	66	68 35N X 129 02W	AIR/GROUND
MAR. 11	8	12	59	68 29N X 128 08W	AIR
MAR. 11	9	9	30	68 27N X 128 09W	GROUND
MAR. 11	10	26	91	68 27N X 128 05W	GROUND
MAR. 11	11	14	31	68 19N X 128 08W	AIR
MAR. 11	12	9	17	68 18N X 128 10W	AIR
MAR. 11	13	6	6	68 18N X 128 18W	AIR
MAR. 11	14	14	33	68 23N X 128 38W	GROUND
MAR. 11	15	7	9	68 27N X 128 35W	AIR
MAR. 11	16	7	13	68 31N X 129 02W	AIR
MAR. 11	17	16	33	68 35N X 129 23W	AIR
MAR. 12	18	12	11	68 30N X 132 00W	AIR
MAR. 12	19	45	122	68 41N X 131 30W	AIR
MAR. 12	20	21	30	68 32N X 131 30W	AIR
MAR. 12	21	27	27	68 12N X 132 28W	AIR
MAR. 28	22	41	87	68 20N X 127 10W	GROUND
MAR. 28	23	20	60	68 20N X 127 05W	AIR
MAR. 28	24	16	50	68 25N X 127 05W	GROUND
MAR. 28	25	11	50	68 25N X 126 50W	AIR
MAR. 28	26	21	49	68 27N X 126 50W	GROUND
MAR. 28	27	11	24	68 30N X 126 40W	AIR
MAR. 28	28	15	37	68 35N X 126 50W	AIR
MAR. 28	29	14	34	68 37N X 127 08W	AIR
MAR. 28	30	26	84	68 36N X 127 20W	GROUND
MAR. 28	31	13	51	68 37N X 127 30W	GROUND
MAR. 31	32	9	10	68 53N X 133 56W	AIR/GROUND

Appendix B. Calculations of age and sex composition.

Sex ratio of animals over 1 year old

522 young bulls + 205 mature bulls + 124 yearling males = 851 1+ males
1275 adult cows + 99 yearling females = 1374 1+ females

% 1+ males = 851/ (851+1374) = 40.0
% 1+ females = 1374/(851+1374) = 60.0

sex ratio = 40.0/60 x 100 = 66.7
1+ males:100 1+ females (Cochran 1977)

Percentage of calves and ratio of calves to 1+ cows

513 calves/(851 1+ males + 1374 1+ females + 513 calves) = 513/2738 = 18.7%

calves/100 one yr+ females = 100 x 513/1374 = 38.9 $^{+}$ 2.57 (x $^{+}$ SE) (Cochran 1977)

Percentage of yearlings and ratio of yearlings to 2+ cows

Total yearlings = 223 (99 females + 124 males)
Total classified = 2738 (513 calves, 851 males, 1374 females)

Percentage of yearlings = 223/2738 = 8.1

yearlings/100 cows = yearlings/cows x 100 0
= 223/1275 x 100 = 17.5 $^{+}$ .39

Survival of calves from birth to April

Assume a) initial calf production of 72 calves/100 females (Parker 1972) and
b) female survival from June 1990 to March 1991 of 93% (Heard and Calef 1979).

Y cows in June/90 x 0.93 = 100 cows in March/91
Y = 100/0.93 = 108. Therefore, 108 June cows = 100 March cows
72 calves/100 cows x 108 = 78 calves June/90
78 calves/100 June cows 38 calves/100 March cows
calf survival rate = 38/78 = 47%

Correction for unrepresented male segment

Brackett et al. (1982) found 73 1+ males/100 females (58% females) in fall 1978.

73/100 x 1374 1+ females = 1003 1+ males but we found 851 1+ males, therefore, add (1003 - 851) = 152 males

Total caribou = 2738 + (152 1+ males) = 2890

a) corrected % calves = 513/2890 = 17.8
b) corrected % yearlings = 223/2890 = 7.7

Sex ratio of unclassified calves

Classified calves = 131 males/97 females = 97/(131+97) = 43 % female

285 unclassified calves x 0.43 = 123 females and 162 males (285 - 123).

Calf sex ratio = 131 + 162 males/97 + 123 females = 133 males/100 females.

Appendix C. Cost of March 1991 Bluenose class counts.

Item		Cost (x $1,000)
Radio tracking	(12 hrs C185 @ 250)	3.0
Helicopter (Bell 206B)	18hrs. @ 600	10.8
Fuel purchase	(16 drums) @ 210	3.4
Fuel cacheing	1 Twin Otter trip	2.5
Supplies and equipment		.5
Total		20.2

Considerable savings were realized (4-5,000) because the caribou distribution allowed us to work out of Inuvik and extensive fuel cacheing or a field camp was not required.